

## Prevalence and Screening of Mental Health Problems Among U.S. Combat Soldiers Pre- and Post- Deployment

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## **ABSTRACT**

**INTRODUCTION/ RATIONALE:** Mental disorders are some of the most common and disabling medical conditions among military service members. Deployment, particularly to combat zones, has been associated with a variety of mental health, social, and occupational effects, including PTSD (15-40% lifetime rate after combat), depression, substance abuse, job loss, unemployment, divorce, and spouse abuse. To better provide early intervention for mental health problems, the U.S. military has been conducting routine psychological screening since 1996 before and after operational deployments, and has included mental health screening in the post deployment health assessment mandated for troops returning from Afghanistan and Iraq. Despite these efforts, little research has been done to determine the prevalence of mental health problems among combat / operational units, the validity and benefits / risks of screening, or the optimal delivery of mental health services.

**METHODS.** Data from two major ongoing research efforts will be presented. The first effort includes the results of brief self-administered surveys (including a depression scale, PTSD checklist, and alcohol screening) conducted among nearly 100,000 U.S. soldiers deployed to Bosnia or Kosovo, as well as data from a recent validation study involving 864 soldiers in which all those who screened negative as well as those who screened positive received a brief evaluation by a psychiatric technician. The second effort involves a large study of the impact of deployment and combat on the mental health of U.S. infantry soldiers deployed to Afghanistan and Iraq ( $N > 6,000$ ), utilizing anonymous cross-sectional and longitudinal survey methods (PHQ depression / anxiety instrument).

**RESULTS:** Of the nearly 100,000 soldiers who received psychological screenings pre- or post-deployment to Kosovo or Bosnia, 15-28% screened positive on the brief self-administered surveys, and 2-12% were recommended for referral. Data from a content validation study indicated that the primary screening methods had high content and construct validity; 37% of the screen positives and 1% of the screen negatives were recommended for referral. In anonymous surveys of soldiers before deployment or within 6 months of return from Afghanistan, 8-10% met screening criteria for depression, anxiety, or PTSD and reported significant functional impairment. There was a low likelihood of using mental health services among soldiers who screened positive; 44% expressed interest in receiving help, but only 24% accessed any services (including chaplains) within the past year. Mental health care was perceived to be highly stigmatizing, particularly by those most in need.

**CONCLUSIONS:** Approximately 10% of U.S. soldiers in these studies screened positive for a mental health problem and had evidence of functional impairment or need for referral. However, barriers to using mental health services exist, which illustrates the need to reassess how services can be delivered in non-stigmatizing ways. The benefits/ risks of screening will be discussed. The most important potential benefit of screening is the early identification and treatment of mental health problems. Potential risks / costs of routine screening include stigmatization which may have unintentional career effects, and the extensive resources required to conduct screening at the population level. Ongoing research to further validate the instruments and determine the benefit / risk ratio of screening will be presented.

## **INTRODUCTION**

Mental health problems are some of the most common and disabling medical conditions that affect service members (1). Among the 1.4 million active duty U.S. military service members, mental disorders are the leading cause of hospitalization for men and the second leading cause for women (second only to pregnancy-related admissions). Six to ten percent of U.S. military personnel receive outpatient treatment for a

mental disorder each year (1,2). Over 25% of service members who receive outpatient care for mental health problems leave military service within six months, a rate that is more than two times higher than the rate of attrition following treatment for any other ICD-9 illness category (1).

Psychiatric conditions are also important health concerns in operational environments. During Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF), approximately 7% of all evacuations from the operational theater were listed as having a primary psychiatric diagnosis. Many studies have demonstrated the strong link between deployment experiences, especially combat, and a variety of adverse mental health, psychosocial, and occupational effects, including PTSD (15-40% lifetime rate after combat), depression, substance abuse, job loss, unemployment, divorce, and severe spouse abuse (3-6). Available data also indicate that most service members with mental health concerns do not seek treatment, due to stigma and other barriers, although very limited research has been conducted in this area (7,8).

Given the obvious importance of mental disorders among military service members and the unusual stressors experienced during deployment, it would be desirable to have simple and cost effective ways to identify those most at risk. Toward this goal, the U.S. military has been conducting psychological screening before and after many operational deployments, beginning particularly with Bosnia rotations in 1996, in an effort to provide early intervention to those with deployment mental health concerns. In conjunction with the recent operations in Iraq and Afghanistan, the U.S. Department of Defense mandated that all personnel undergo a standardized post-deployment medical screening to include mental health concerns. Despite these efforts, little research has been done to determine the prevalence among service members in combat / operational units, the validity, benefits, and risks of screening programs, and the optimal delivery of mental health services before and after deployment. This paper will review the history of psychological screening pre- and post- deployment in the U.S. military since 1996, the potential risks and benefits of screening, and data from recent efforts to develop validated screening instruments. Current research initiatives will be outlined.

Note that there is much confusion over the term “screening” for psychological or mental health problems, and it is important to define the scope of this paper. The term “screening” is often used to refer to efforts to identify which individuals are fit to join the military and which should be excluded (screening for fitness for duty or recruitment screening). Research has failed to show the effectiveness of this type of screening (9). The term “screening” can also be used to refer to complex selection processes for certain types of assignments, such as aviation, special operations, and law enforcement. This paper will only focus on the medical uses of screening to identify individuals with mental health problems before or after deployment for the purpose of providing adequate services to these individuals so that they can continue to be successful in the military.

### **PSYCHOLOGICAL SCREENING IN U.S. MILITARY-BOSNIA TO PRESENT.**

Deployment psychological screening programs have been used routinely to assess the mental health of soldiers beginning with deployments to Bosnia 1996, in part due to the high rates of stress and physical health concerns observed among veterans of the 1990-91 Gulf War. Initially mandated by the Office of the Secretary of Defense for Health Affairs and developed by the Joint Medical Surveillance Program, the psychological screening included three self administered symptom scales including the Zung depression scale (10), a PTSD checklist that followed DSM-4 criteria (11), and the 4-question CAGE screening test for alcohol abuse (12). As the program evolved, there was some refinement in the instruments including replacing the CAGE, due to very high false positive rates, with the AUDIT (13). Since 1996, over 100,000 soldiers have

been screened using these instruments either just before deployment, during the redeployment process, or just after returning to garrison (14). Rates of screening positive to one or more of these scales has ranged from 15-28% of soldiers. These rates reflect broad screening criteria using generally established cutoff criteria and do not require any evidence of functional impairment or high symptom severity. Those soldiers who screened positive received a brief (~10 minute) clinical screening procedure usually conducted by a psychiatric technician. Of the soldiers who screened positive, 2-12% received a referral for further evaluation or treatment, although it is unknown how many actually followed through with these referrals. Less than 1% of all soldiers screened required immediate referral for an urgent mental health problem.

Data from the program has been used to better define optimal deployment length and the relationship of stress levels and the phase of the deployment cycle (14-16). The program has also potentially served a useful purpose of identifying soldiers in need of additional support from mental health services in the operational setting or after re-deployment home.

Despite these extensive efforts, the deployment screening program has generated questions about the potential risks and drawbacks compared with the benefits. As mentioned earlier, the screening program was originally developed, in part, due to concerns about high rates of mental health and medical symptoms following the 1990-91 Gulf War, but the screening program was not originally designed to clarify the relationship between deployment stressors and post-deployment mental health problems. It is also unknown if psychological screening reduces mental health casualties or improves outcomes among soldiers during or after deployment through early clinical interventions. Questions of the efficacy of early interventions are not limited to screening, but are shared by all initiatives that provide early interventions following exposure to stressors (17).

There are also questions regarding the validity of the instruments used for the purposes of screening healthy adults in operational settings. Although validated in clinical populations, instruments such as the Zung, PTSD checklist, CAGE, and AUDIT have not been validated for use in young, predominantly male healthy soldiers who may be experiencing significant stress related to the deployment. Consistently, rates of screening positive have been lower as soldiers prepare to return to their home station compared with soldiers in garrison or those preparing for deployment (14,16). However, the implications of these differences are uncertain because they are largely based upon cross-sectional data, and do not include combat deployments.

Deployment-related psychological screening is resource intensive, usually drawing mental health professionals out of the traditional clinic setting to administer the screening at the deployment processing points. This may serve a very useful purpose of allowing mental health professionals to interact with soldiers at the unit level, but it is unknown how many of the soldiers with acute mental health problems identified through screening would have been identified through traditional referral routes. Although the screening is designed to provide targeted interventions to those most at risk, the high sensitivity (and corresponding low specificity) results in 15-28% of soldiers needing a face-to-face interview with a psychiatric technician (who themselves require supervision from licensed providers). Thus, deployments involving thousands of soldiers can considerably burden the mental health care system.

In addition, there may be unintended consequences and risks inherent in the screening process. Traditional psychological screening has been associated with stigma during a deployment to Bosnia. (18). In this study, soldiers who screened positive for a psychiatric condition were more likely to feel stigmatized than soldiers who screened positive for another medical condition. During the original mass population screening program, soldiers who screened positive had to stand in a different line to be seen by the psychiatric technician, and other soldiers could easily figure out which line a soldier was standing in. It is unknown

whether this potential stigmatization results in unintended career consequences. Also recent data based on anonymous surveys (8) suggests that perceptions of stigma are higher among soldiers with mental health problems than other soldiers, so it is unknown how the process of conducting the screening may have affected perceptions of stigma. It is also unknown if the high rate of referrals related to this triage system may result in unnecessary treatment and iatrogenic health or adverse occupational consequences for some soldiers. For these reasons, Health Affairs discontinued routine deployment psychological screening after a Combat Stress Control Panel recommended this in 1999.

Despite these concerns, deployment screening programs have continued in the U.S. military for many deployments to Kosovo and Bosnia, and more recently with OIF and OEF rotations. Commanders often encourage psychological screening because they perceive this as a constructive way to take care of soldiers and to show that the organization cares for soldiers. Such programs generate a sense of satisfaction among leaders that something is being done to assure the psychological health of soldiers, particularly in the context of post-gulf war deployment health issues. Soldiers, as well, often report that they appreciate that someone took the time to sit down with them and discuss their stressors. The satisfaction of soldiers and leaders have often drives continued program implementation, despite the fact that these programs have not been assessed as to whether they reduce psychological casualties. One of the interesting findings from the Britt paper was that although soldiers who screened positive for a mental health concern were more likely to feel stigmatized than soldiers who screened positive for another medical issue, they were more likely to view the screening program as beneficial (18). Thus, perhaps stigma is less important to soldiers than receiving help.

Although the data supporting the use of deployment screening is mixed, organizational pressures frequently lead to program implementation, and clinicians assigned to operational units do their best to make these programs a success. Clinicians working with operational units will, of course, not refuse their Commander's request for such a program, where or not there is proven clinical efficacy.

Beginning with OEF/OIF and the large number of troops deployed, DoD mandated an expanded post-deployment health assessment for all returning troops. The assessment consists of a 4 page checklist (Department of Defense Form Number-2796) followed by a brief interview by a primary care clinician who reviews the form and determines if further referral is indicated. Areas covered include location of deployment, environmental and operational exposures, physical symptoms, and mental health. Mental health assessment is limited to questions on potentially traumatic exposures, four questions covering key domains of PTSD, two stem questions for depression, one screening question about suicidal ideation, two questions related to concerns about aggression, and one question about interest in receiving help. The reliability and validity of these questions is unknown.

## **CURRENT RESEARCH QUESTIONS AND INITIATIVES.**

The Walter Reed Army Institute of Research (WRAIR), which includes the Medical Research Unit-Europe, has developed a program to define the extent of deployment-related mental health problems and optimal screening methods. The current research can be broadly grouped into two categories: 1) studies to define the prevalence of mental health problems and determine the impact of deployments among soldiers from operational units and families, and 2) studies to determine the validity, effectiveness, and optimal methods to screen for mental health problems pre- and post-deployment.

## **PREVALENCE AND DEPLOYMENT RISK-FACTOR STUDIES**

Although there is an extensive literature documenting the health, occupational, and social morbidity associated with deployment and combat (3-6, 19-21), most of these studies have been conducted years after combat exposure. Recent studies that have begun to document the burden of mental disorders among U.S. military personnel have been based primarily on health care utilization data (1,2). There have been very few studies that have directly assessed the prevalence of mental health problems among active duty personnel using validated clinical instruments among populations of healthy (non-clinical) service members, especially studies conducted proximal to the time of deployment. Studies have not measured the relationship of deployment and combat to a wide range of outcomes using longitudinal cohort methods among service members surveyed throughout the deployment cycle.

To address these scientific questions, researchers at WRAIR initiated a large study in January 2003 to assess the impact of current military operations in Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF)-Afghanistan on the health and wellbeing of soldiers and family members. This study involves both cross-sectional and longitudinal design methods. Soldiers from operational units deploying to OIF and OEF have been surveyed before deployment, and / or after returning from deployment. Post-deployment assessments are being conducted at 3-4 months, 6 months, and 12 months after returning from deployment. Outcomes include depression, anxiety, and PTSD measured by validated self-administered survey instruments. Other outcomes include alcohol use, aggression, and family functioning. Surveys are administered anonymously in an effort to encourage honest answers.

Preliminary analysis of data from soldiers returning from OEF indicates that approximately 10% expressed interest in receiving help for a stress, emotional, alcohol, or family problem, and a similar percent met criteria for depression, anxiety, or PTSD, using a conservative definition that included the requirement that there be evidence of functional impairment or high symptom severity. Among soldiers who screened positive, there was a low likelihood of using mental health services. Only 44% of these soldiers expressed interest in receiving help, and only 24% accessed any services (including chaplains) within the past year. Mental health care was perceived to be highly stigmatizing, particularly by soldiers most in need. Analyses are currently ongoing to determine the prevalence of mental health concerns among soldiers who have returned from OIF.

## **DEPLOYMENT MENTAL HEALTH SCREENING STUDIES**

Beginning in 2001, WRAIR together with USAMRU-E initiated an effort to validate existing screening instruments that had been utilized since 1996, and assess if there were new instruments with higher validity and reliability (14). The primary objective of this program is to develop a simple, easily administered, valid, and cost effective screening procedure for population-level assessment and triage of mental health problems pre- and post- deployment. Evaluation of the new post-deployment health assessment (DD-2796) is also part of this program. In a preliminary validation study, researchers conducted screening among 864 soldiers deploying to Kosovo (rotation 4B - Oct 2002). The primary study objectives were 1) to determine if existing screening criteria are effective in identifying soldiers who need referral (validity), and 2) to determine if the instrument covered the important problems and symptoms experienced by soldiers. In this study, all soldiers who underwent the primary paper screening had a brief clinical interview with a psychiatric technician. Unfortunately, operational constraints made it impossible to keep the results of the primary screen blind from the psychiatric technician who conducted the interview, so it was not possible to directly assess sensitivity and specificity. However, the technicians were able to assess if there was functional impairment,

clarify the responses that soldiers gave on the primary screen, and assess if the content area on the primary screen was sufficient. Of the 864 soldiers who underwent screening, 183 (21%) screened positive on the primary screening instrument, consistent with other deployments.

Of the 183 screen positives, 68 (37%) were recommended for referral (5 immediate) and 67 (37%) had “sub-clinical” complaints that did not require referral. Less than 1% were assessed as non-deployable. Of the 681 screen negatives, only 7 (1%) were identified as having problems sufficient to recommend referral (all had relationship problems). No new content areas were identified in the interviews that were not already included on the screening instrument. Study findings also indicated that the existing screening tools had construct validity. Positive screening was associated with impaired social / occupational functioning, past history of counseling or childhood adversity (trauma), and family history of mental health problems. The study represented the first step at assessing validity of the screening.

Data from the most definitive study on the validity of the deployment psychological screening program has just been collected among 1,600 soldiers returning from a one-year deployment to Iraq. In this study personnel who conducted the secondary clinical interviews were kept blind to the results of the primary screen and they used a standardized structured diagnostic interview following DSM-IV criteria for PTSD, depression, and alcohol abuse using the MINI (22). The secondary interview was conducted among all soldiers who screened positive on the primary screen and a random sample of 20% of the soldiers who screened negative. The new procedure of interviewing soldiers who screened negative not only allows for validity checks, but also serves the purpose of reducing stigma. Soldiers were briefed in advance about the random nature of the secondary interview. Analyses of these data are ongoing. In addition to validating the instruments used in the Kosovo and Bosnia deployments, this study will also provide data on the optimal primary screening instrument, to include the PHQ for depression (23) and the questions included on the post-deployment health assessment.

## **CONCLUSION.**

In summary, mental disorders are an important cause of morbidity among military service members, and it is likely that there will be significant mental health effects of recent operations in Iraq and Afghanistan. Developing validated deployment screening programs linked to prevention and early interventions is a high priority. The most important potential benefit of deployment screening is the early identification and intervention of mental health and behavioral problems, which in turn may reduce the chronicity or severity of these conditions, improve soldier and family functioning, and improve unit readiness. In addition, screening serves the purpose of making mental health services immediately available to soldiers thereby reducing one of the key barriers to care. In any pre-deployment screening program there are always a few soldiers who are identified who should not deploy due to overt mental health problems (e.g. severe symptoms, such as withdrawal from alcohol dependence). This accounts for less than 1% of soldiers who are screened, and it is unknown how many of these soldiers would have been detected through usual command directed referral routes. For post-deployment screening, there is the potential to identify soldiers who are at high risk health concerns and facilitate appropriate referral. Other potential benefits include the Commanders' and soldiers' satisfaction that something is being done to address the psychological effects of deployment. Commanders often request screening, and soldiers often report appreciation that the military is taking an interest in their well-being. The argument that screening provides a way to target resources to a segment of the population that is most in need may be offset by the resource intensive nature of the screening program itself.

Potential risks and drawbacks of routine screening include stigmatization with unintended career consequences. Further work is needed to devise procedures to reduce stigma. In addition, screening may result in potential iatrogenic effects of referring large numbers of persons to mental health. Soldiers may inadvertently identify themselves as a patient because they have been positively screened. There is also a lack of data showing that screening methods have reasonable sensitivity, specificity, and predictive value in correctly identifying those who would benefit from referral.

Ongoing research includes an extensive study of the impact of current operations in Iraq and Afghanistan on soldiers and families and the first direct validation of deployment mental health screening using structured diagnostic interviews conducted by persons who are blind to the results of the primary screen. Further research is needed to develop optimal procedures for survey administration. There are important distinctions between deployment screening programs designed to identify individuals who may be at risk, and anonymous needs assessments at the population level designed to measure the behavioral health needs in the population. Anonymous surveys also may encourage self-referral. Defining the appropriate context and purpose of the screening program, and developing a better understanding of the risks and benefits of different screening procedures is critical. By prioritizing both early identification and epidemiological surveillance, the U.S. military is establishing a basis from which to develop optimal screening programs.

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## **SYMPOSIA DISCUSSION - PAPER 2**

**Authors Name:** Col Hoge (US)

**Discussor's Name:** Dr Lam (US)

**Question:**

Pre-deployment screens are mostly at time of high stress – Would it not be more useful to screen garrison communities rather than immediately pre-deployment?

**Author's Reply:**

Yes, some studies are being done in this environment.